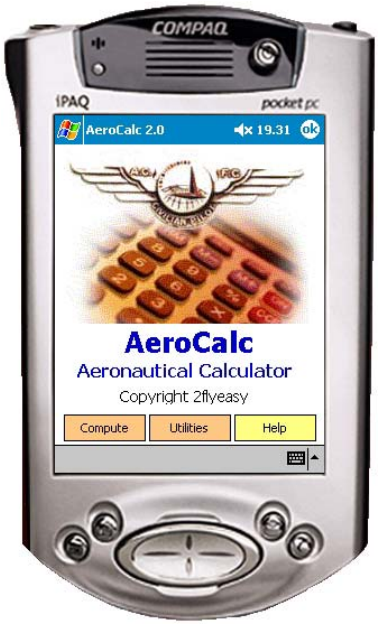
AEROCALC

User's Manual



Release 2.0
www.2flyeasy.com

Download the software

Go to Handango or Pocket Gear site to download AeroCalc. Follow the instructions and save AeroCalc.exe file in a directory of your choice.

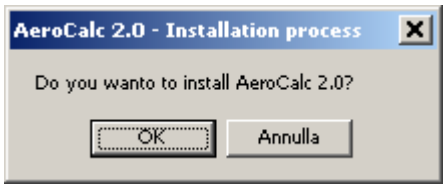
Start installation program

Connect your Pocket PC device to your desktop (or portable) computer using USB, serial or IRDA port.

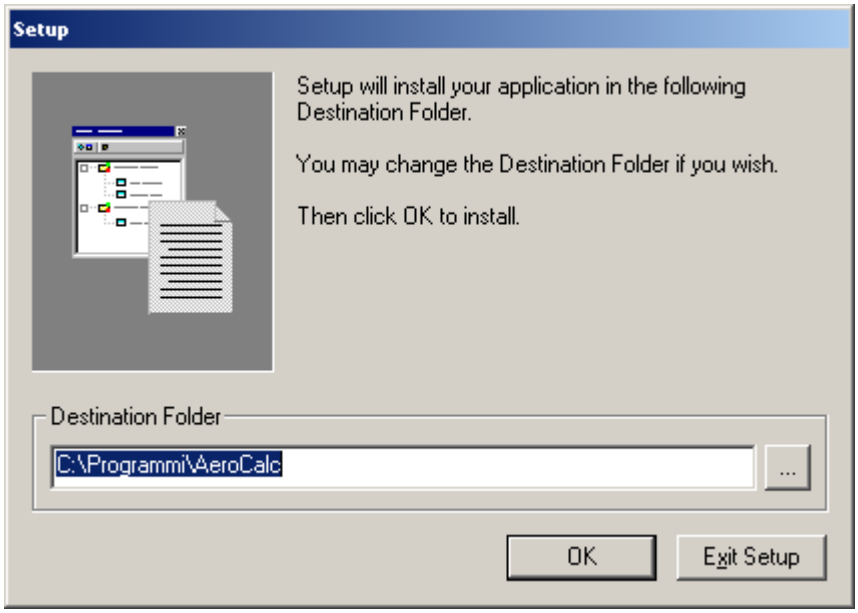
Verify that Microsoft ActiveSync is up and running.

Make double click on AeroCalc icon to start the installation program. 

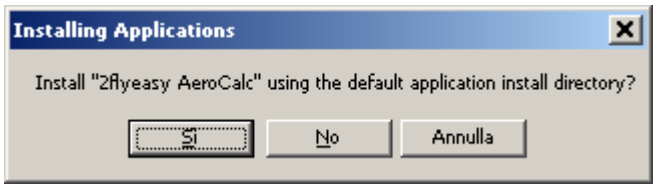
Confirm your choice clicking Ok button in the next window.



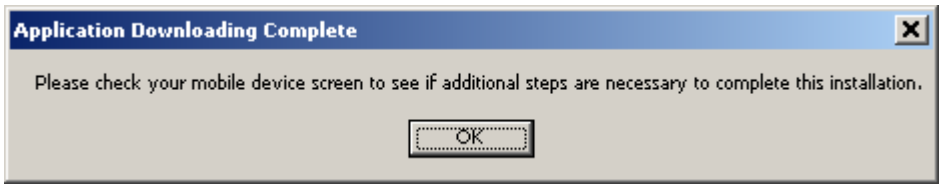
Confirm or change the destination folder where to install the application in the desktop computer.



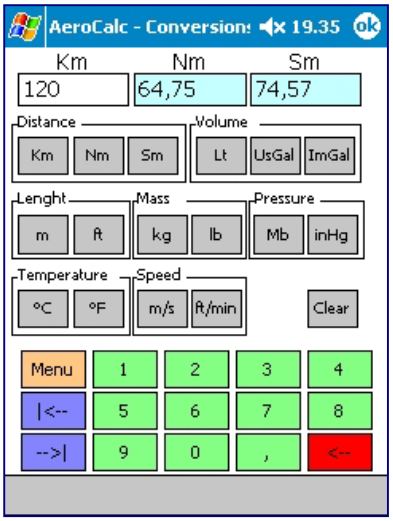
Confirm or modify the application install directory inside Pocket PC.



After downloaded the software in the Pocket PC, check your mobile device screen to see if additional steps are necessary to complete this installation.



Conversions



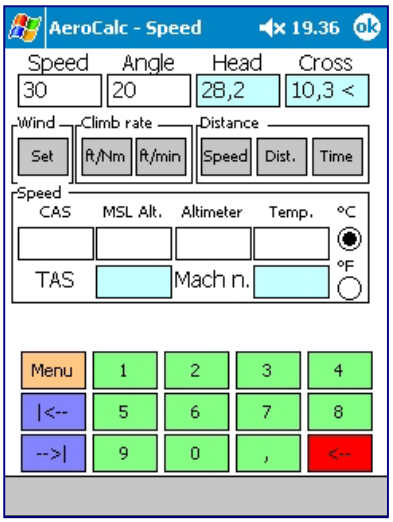
Tap **Compute** > **Conversions** to open the form. Enter the value and tap the unit of measure button that you wish to convert. Read the result(s).

Example:
To convert 120 Kilometers to Nautical or Statute Miles enter **120** and tap **Km** button. The program will display the corresponding values.

Speed

Tap **Compute** > **Speed** to open the form.

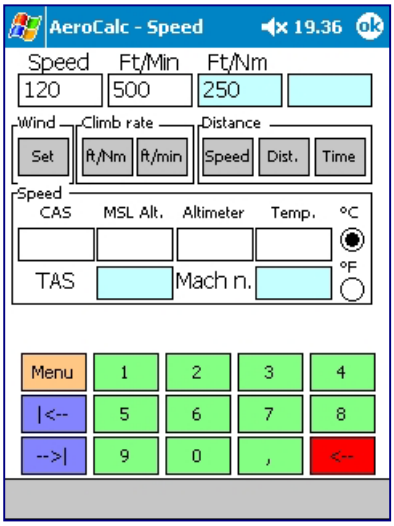
Wind



To calculate the wind component speeds tap **Set** button in **Wind** frame. Enter the wind speed, in knots, and the angle respect your heading. The program will calculate the head (or rear) and cross components in knots. The > symbol indicates from left, < from right.

Example:
To calculate the head and lateral components of 30 knots wind with 20 degree angle, tap **Set** button in **Wind** frame and enter 30 as speed and 20 as angle. The program will display 28,2 knots as head component and 10,3 knots from right as cross component.

Climb rate



To calculate the climb/descent rate tap the **ft/min** button in Climb rate frame, enter the ground speed in Knots and the gradient value in feet per Nautical Mile. The program will display the climb/descent rate in feet per minute.

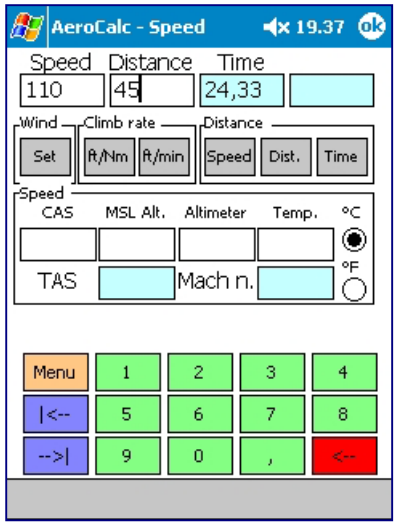
To calculate the climb/descent gradient tap the **ft/Nm** button in Climb rate frame, enter the ground speed in Knots and the climb rate in feet per minute. The program will display the climb/descent gradient in feet per Nautical Mile.

Example:
To calculate the climb gradient (distance) with a 120 Knots speed and 500 feet per minute climb rate, tap **ft/Nm** button, enter 120 as speed and 500 as climb rate. The program will display the gradient of 250 feet per Nautical Mile.

Distance

To calculate speed, distance or time, tap the button corresponding to the unit you wish to compute, enter the values required and read the result.

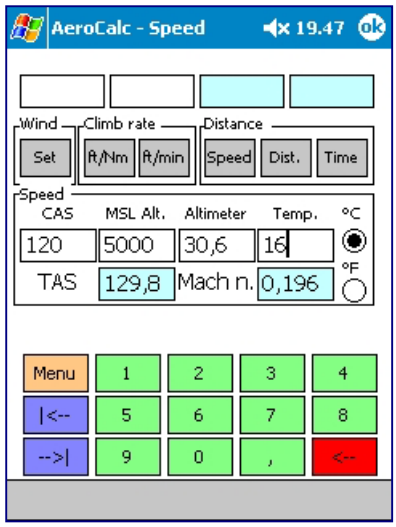
Example:
To calculate how much time needs to cover 45 Nautical Miles having a 110 Knots speed, tap **Time** button in Distance frame, enter 110 as speed and 45 as distance. The program will display 24 minutes and 33 seconds.



Speed

To compute the True Airspeed (TAS) and the Mach number enter your Calibrated Airspeed (CAS) in Knots, the MSL altitude in feet, the sea level altimeter setting in inches of mercury and the outside air temperature in Centigrade or Fahrenheit degree (selecting the radio button). The program will display the TAS speed, in Knots, and the Mach number.

Example:
To calculate your TAS speed having a 120 Knots CAS at 5000 feet MSL with altimeter set at 30,6 inches of mercury and air temperature of 16° Centigrade, enter these values in the related fields. The program will display 129,8 as TAS and 0,196 as Mach number.



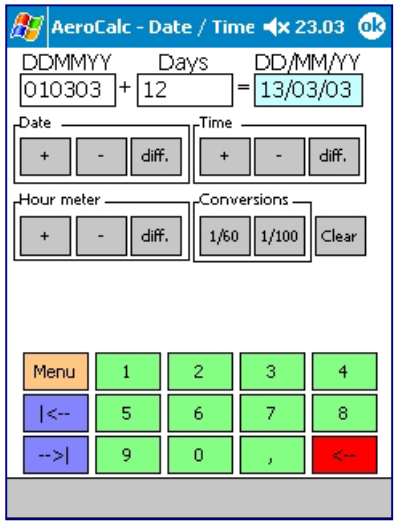
Date and time

Tap **Compute** > **Date / Time** to open the form.

Date

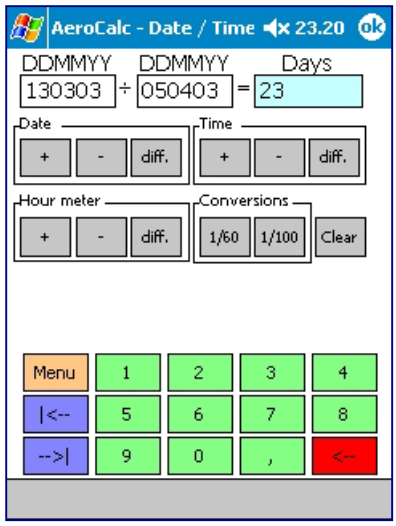
To add or subtract some days from a date tap **+** or **-** button in **Date** frame. Enter the date (format MMDDYY or DDMMYY according to your international setting) and the number of the days. The program will calculate the resulting date.

Example:
To calculate the date 12 days after the first of march, enter 010303 as date (or 030103 according to your international setting) and 12 as days . The program will display 13/03/03 (or 03/13/03).



To calculate the number of days between two dates tap **diff** button in **Date** frame. Enter the starting date and the ending one (format MMDDYY or DDMMYY according to your international setting). The program will calculate the resulting number of days.

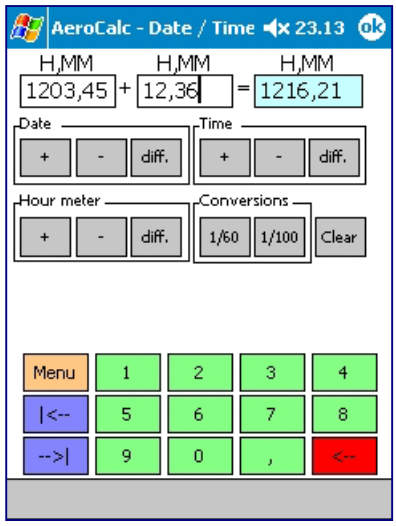
Example:
To calculate the number of days between the thirteenth of march and the fifth of april, enter 130303 and 050403 as date (or 031303 and 040503 according to your international setting). The program will display 23 days.



Time

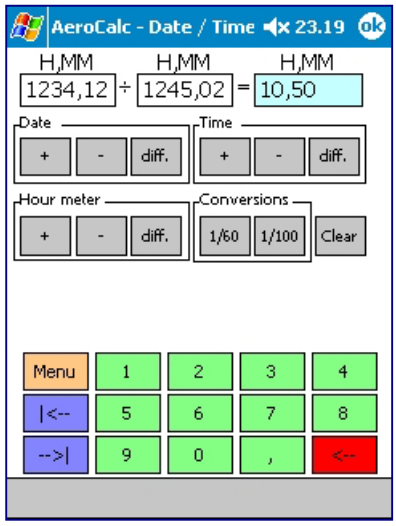
To add or subtract time from time tap **+** or **-** button in **Time** frame. Enter the staring time (format H,MM, where hours may be one or more digits and minutes must be two digits) and the time to add or subtract. The program will calculate the resulting time.

Example:
To calculate the resulting time adding 12 hours and 36 minutes to 1203 hours and 45 minutes enter 1203,45 and 12,36. The program will display 1216,21 (1216 hours and 21 minutes).



To calculate the number of hours and minutes between two times tap **diff** button in **Time** frame. Enter the starting time and the ending one (format H,MM, where hours may be one or more digits and minutes must be two digits). The program will calculate the resulting number of hours and minutes.

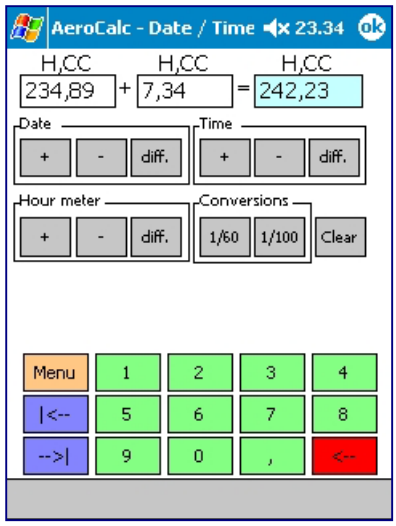
Example:
To calculate the time between 1234 hours and 12 minutes and 1245 hours and 2 minutes enter 1234,12 and 1245,02. The program will display 10,50 (10 hours and 50 minutes).



Hour meter

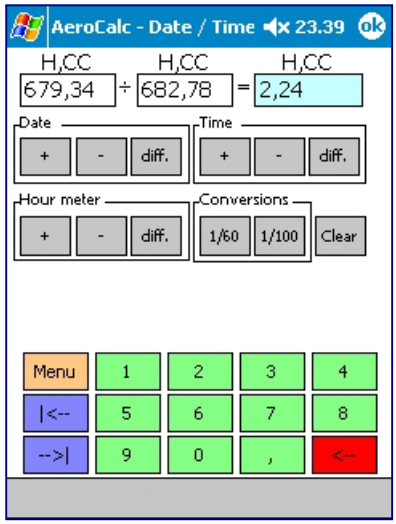
To add or subtract time from time tap **+** or **-** button in **Hour meter** frame. Enter the staring time (format H,CC, where hours may be one or more digits and hundredths must be two digits) and the time to add or subtract. The program will calculate the resulting time.

Example:
To calculate the resulting time adding 7 hours and 34 hundredths to 234 hours and 89 hundredths enter 234,89 and 7,34. The program will display 242,23 (242 hours and 23 hundredths).



To calculate the number of hours and hundredths between two times tap **diff** button in **Hour meter** frame. Enter the starting time and the ending one (format H,CC, where hours may be one or more digits and hundredths must be two digits). The program will calculate the resulting number of hours and hundredths.

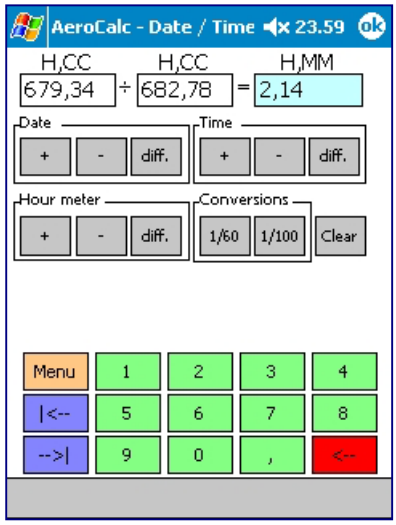
Example:
To calculate the time between 679 hours and 34 hundredths and 682 hours and 78 hundredths enter 679,34 and 682,78. The program will display 2,24 (2 hours and 24 hundredths).



Conversions

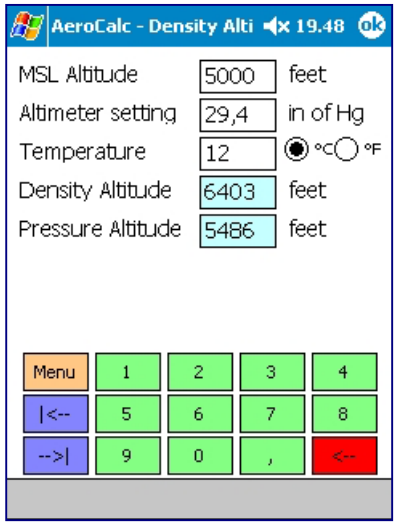
To convert the result of time calculation (time and hour meter frames) tap **1/60** button or **1/100** button in **Conversions** frame. The program will convert the result.

Example:
To covert in hours and minutes the result of the previous example tap 1/60 button. The program will display 2,14 (2 hours and 14 minutes).



Density and pressure altitude

Tap **Compute** > **Density Altitude** to open the form.

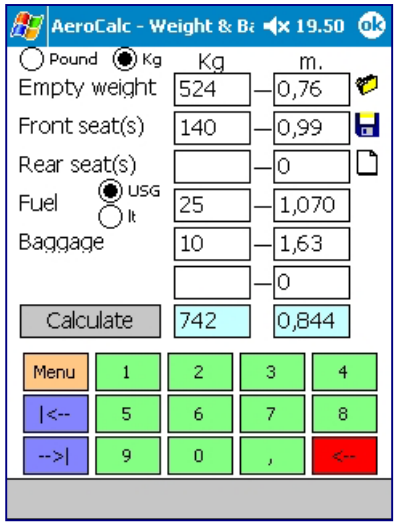


To compute the density altitude and the pressure altitude enter the MSL altitude in feet, the sea level altimeter setting in inches of mercury and the outside air temperature in Centigrade or Fahrenheit degree (selecting the radio button). The program will display both values.

Example:
To calculate the density altitude and the pressure altitude at 5000 feet MSL with altimeter set at 29,4 inches of mercury and air temperature of 12° Centigrade, enter these values in the related fields. The program will display 6403 feet as density altitude and 5486 feet as pressure altitude.

Weight and Balance

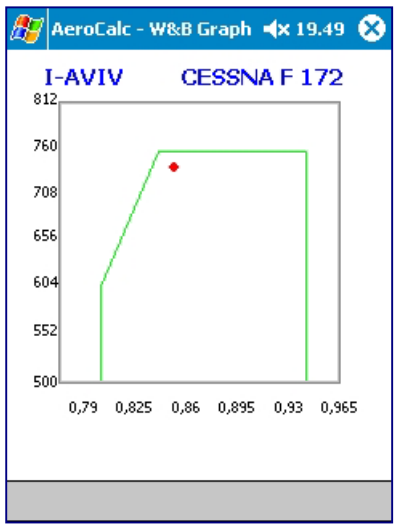
Tap **Compute** > **Weight & Balance** to open the form.



Calculation

Choice the unit of measure you prefer using the radio button (Pound – Inches or Kilogram – meters). Enter, for each row, the weight (first column) and the distance from the datum (second column). If the load is forward of the datum, enter the distance as negative number. Choice the unit of measure for fuel using the radio button. Tap **Calculate** to compute the total weight and the distance from the reference datum.

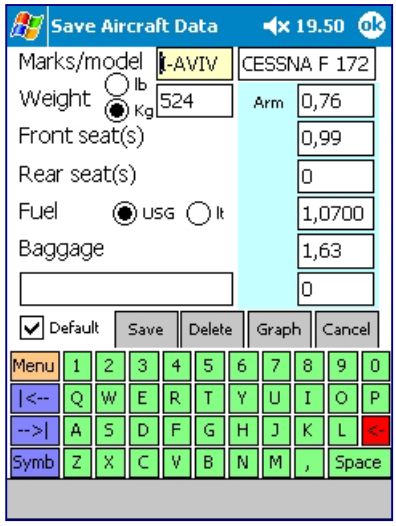
Example:
A Cessna 152 with an empty weight of 524 Kg, two passengers for a total of 140 Kg, 25 USG of fuel and a baggage of 10 Kg will have a total weight of 742 Kg and a distance of 0,844 meters after the reference datum.



Diagram

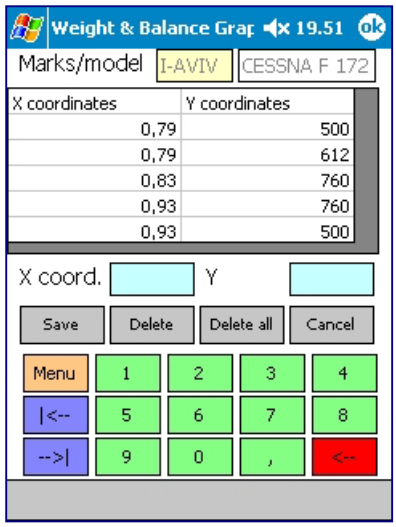
Tapping the Calculate button, if the aircraft has diagram data, the program will display the weight diagram. To define an aircraft and its data read the next paragraph.
If the point is out of the diagram, the minimum or the maxim labels of ordinate or abscissa axes will be red coloured (depending where is located the point).
Closing the form, you will return to the Weight and Balance data form.

Define, modify or delete aircrafts data



To save, modify or delete the current aircraft data tap the disk icon . The available data are (from the up to the bottom, left to right):

- Registration marks,
- Model,
- Weight unit of measure (radio button),
- Empty weight,
- Empty weight distance from the reference datum,
- Front seat(s) distance from the reference datum,
- Rear seat(s) distance from the reference datum,
- Fuel unit of measure (radio button),
- Fuel distance from the reference datum,
- Baggage distance from the reference datum,
- User defined label for other load,
- User defined load distance from the reference datum,
- Check button to set the current data as default.



To create, modify or delete the diagram data tap the **Graph** button.

To insert new rows enter values in X coord. and Y coord. fields and tap **Save** button.

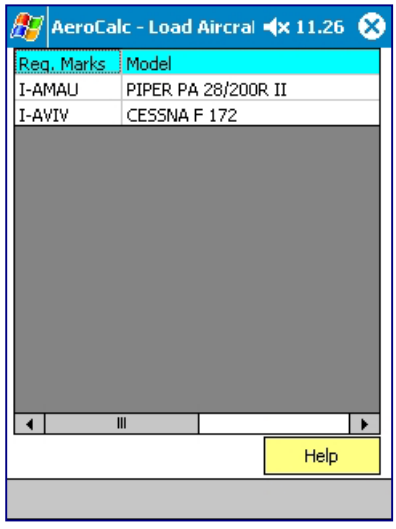
To modify a value tap over the row and edit the values. To save the changes tap the **Save** button.

To delete a single row tap over the row and tap the **Delete** button. Confirm your choice in the alert window.

To delete all rows tap the **Delete All** button. Confirm your choice in the alert window.

To return to Aircraft Data form tap the **Cancel** button.

Load other aircrafts data



To load aircrafts data from AeroCalc database tap the folder icon .
Select the aircraft tapping the related row.

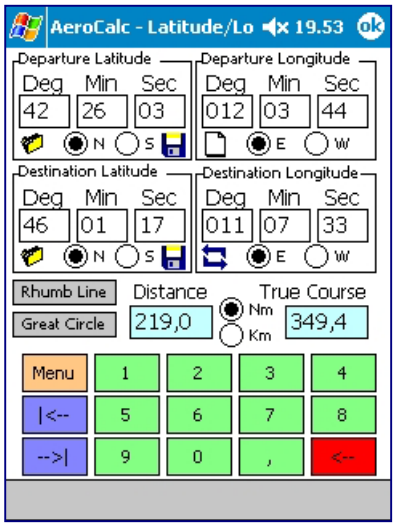
Navigation

Tap **Compute** > **Navigation** to open the form.

To calculate Rhumb Line and Great Circle distance and true course, enter departure and destination latitude and longitude and tap the related button. The distance may be calculated in Nautical miles or Kilometers.

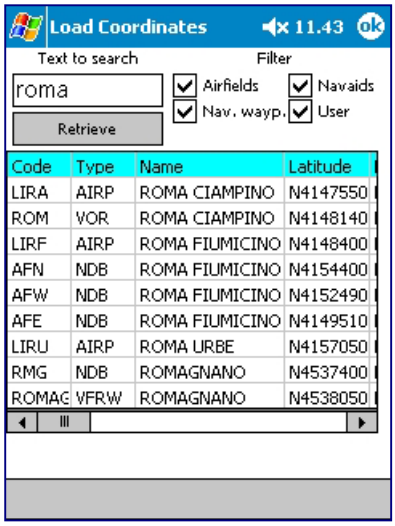
A Great Circle route is the shortest course between two points on the surface of a sphere whose true course changes as the flight progresses.

A Rhumb Line is a stright line drawn over a flat map whose true course remains constant.



Load Departure or Destination latitude and longitude

To load Departure or Destination latitude and longitude from AeroCalc database tap the folder icon . Enter the initials of the text to search and check or uncheck the filter options to limit the search. Tap the **Retrieve** button to start the search. Select the waypoint tapping the related row.



Note:
The searching time depends from the number of records stored in database and from the length of text to search. More accurate will be the text, faster will be the search.

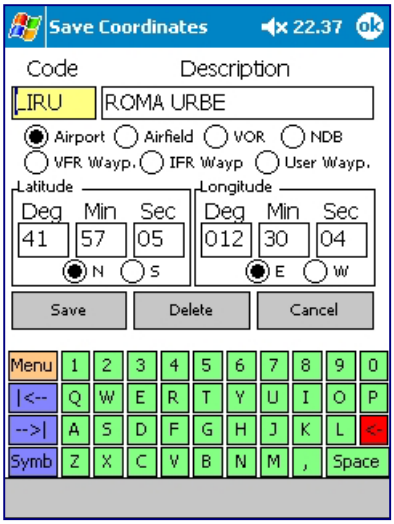
Switch Destination with Departure

To switch Departure latitude and longitude with Destination ones tap the switch icon . Destination latitude and longitude will replace Departure data, while Destination ones will be cleared.

Automatic Switch Destination with Departure

When you load Destination latitude and longitude the program automatically replace the Departure data with the previous Destination latitude and longitude. This feature is very useful when you have to calculate different legs of a route. After loaded the departure point and the first waypoint, you have only to load in order the next waypoints to plan your route.

Save or delete Departure or Destination coordinates



To save, modify or delete Departure or Destination coordinates tap the disk icon . The available data are (from the up to the bottom, left to right):

- Point code,
- Point description,
- Point category,
- Latitude,
- Longitude.

The point categories are:

- Airport,
- Airfield,
- VOR,
- NDB,
- VFR reporting point,
- IFR reporting point,
- User waypoint.

To insert new points enter the required values and tap the **Save** button.

To modify a point edit the values and save the changes tapping the **Save** button.

To delete a point tap the **Delete** button. Confirm your choice in the alert window.

To return to Navigation form tap the **Cancel** button.

The Wind Triangle

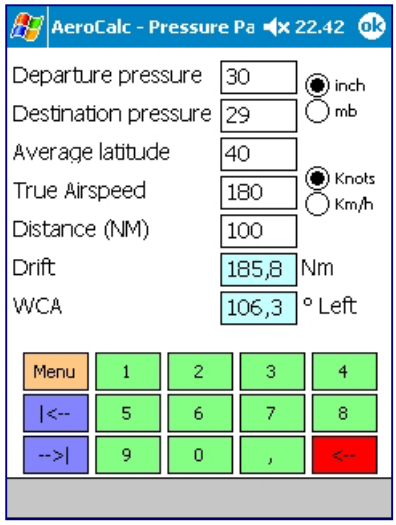
Tap **Compute** > **Wind Triangle** to open the form.

To compute the Ground Speed, the True Heading and the Wind Correction Angle (WCA) enter the wind direction in degrees, the wind speed in Knots, the true course in degrees and the true airspeed in Knots. The program will display the three values.

Pressure Pattern Navigation

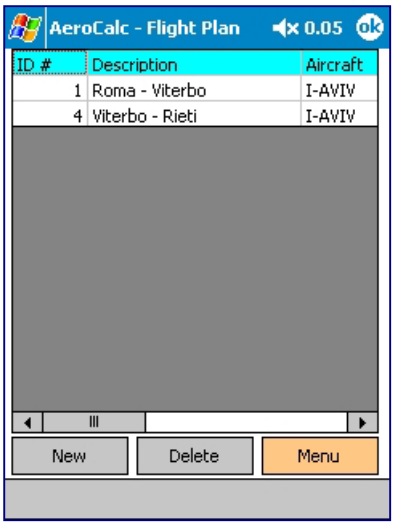
Tap **Compute** > **Pressure Pattern Nav.** to open the form.

Pressure Pattern Navigation computes the net amount of Drift while flying in long trips. The Drift value is the distance off course (left or right) you would be after flying to your destination without wind correction. The Wind Correction Angle (WCA) must be applied to your course throughout the trip to avoid off course.
Enter departure pressure in inches of mercury (or in millibar selecting the radio button), destination pressure, the average latitude along the route, the True airspeed in Knots or Km/h and the distance in Nautical miles.
The program will calculate the Drift and the Wind Correction Angle.



Flight Plan

Tap **Compute** > **Flight Plan** to open the form.



To create a new flight plan tap **New** button.

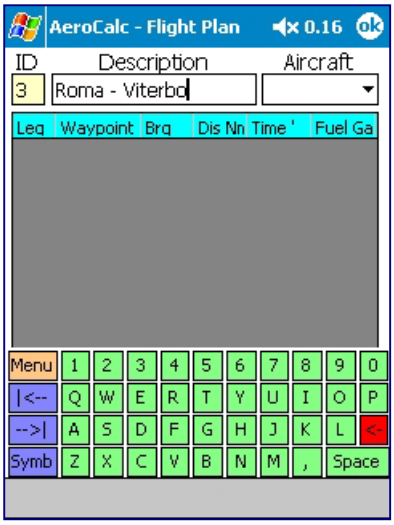
To select a flight plan tap on it.

To delete a flight plan tap **Delete** button.

Flight Plan definition / edit

Data are (from left to right):

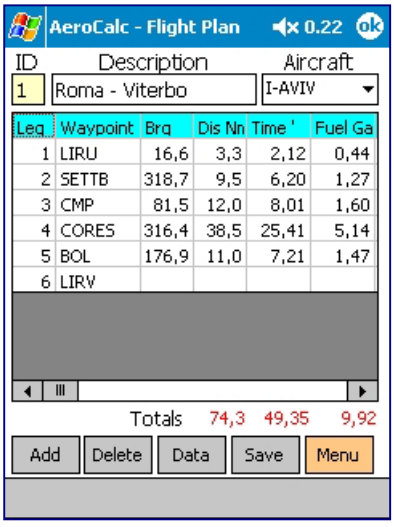
- Flight plan identifier (must be a positive number, mandatory);
- Flight plan description (free text to define the route)
- Aircraft to fly (optional).



Aircraft is optional. If you choose an aircraft and if this has cruise speed and fuel consumption, the program will calculate the total amount of time and fuel required.

To add, delete, save the flight plan waypoint or recall the aircraft data form, tap on **waypoints grid** or select an aircraft.

To insert a row (at the end of the list) tap **Add** button and choose a waypoint from the *Load Coordinates* form. The program will automatically calculate the bearing, the distance, the time and fuel required.

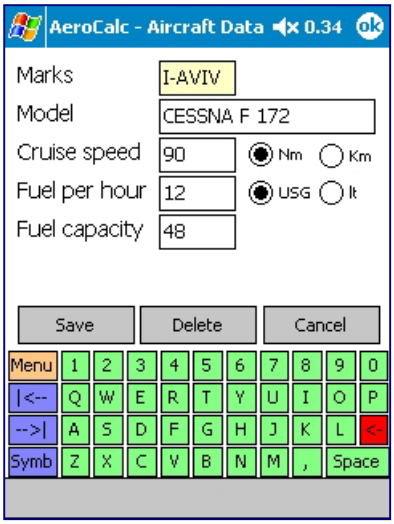


According to aircraft options the distance may be in nautical miles (default if none aircraft is selected) or Kilometers. Fuel may be in US gallons (default if none aircraft is selected) or liters. Time is always in minutes.

To delete the last row tap **Delete** button. The program will recalculate all values.

To save the flight plan with all waypoints tap **Save** button. The program will request a confirmation before to save data.

To edit, save or delete aircraft options tap **Data** button. The available data are (from the up to the bottom, left to right):



- Registration marks,
- Model,
- Cruise speed,
- Cruise speed unit of measure (radio button),
- Fuel consumption per hour,
- Fuel unit of measure (radio button),
- Fuel capacity

To save all data tap **Save** button.

To delete the aircraft with all its data tap **Delete** button. Confirm your choice in the alert window.

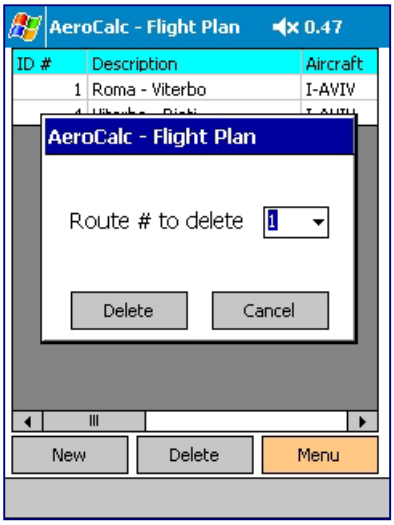
WARNING!
Weight and Balance and Flight Plan share the same table (aircraft).

To exit tap **Cancel** button.

Flight Plan deletion

To delete a flight plan tap **Delete** button from Flight Plan list.

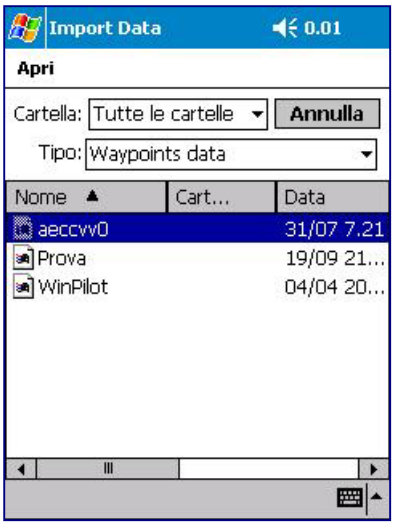
Select the flight plan to delete and tap **Delete** button. Confirm your choice in the alert window.



To exit tap **Cancel** button.

Import waypoints

Tap **Utilities** > **Import Waypoints** to open the form.



Select the folder to get the file from and the data type.
Choose the file tapping on it.
The program will start to import data, increasing the number of loaded records.

When the import is completed close the form to return to main form.

If file format is not valid, the program will show an error message for each wrong record. These records will be discharged.

WARNING!
No control for duplicated records is made during the import. Before importing any file do check if the data are already present in the database.

Export waypoints

Tap **Utilities** > **Export Waypoints** to open the form.

Enter the *name* for the new file, the *folder* where locate the file, the file *data type* to extract and the *device* where to store the file (main memory, compact flash or SD card, Ipaq File Store).

Tap on **Ok** button to start the process.

Delete all waypoints

Tap **Utilities** > **Delete All Waypoints** to start the process. The program request a confirmation before to delete all waypoints.

WARNING!
The command is not reversible. Data, once deleted, cannot be restored.

A APPENDIX A
WAYPOINTS FILE DATA FORMAT

Waypoints File Data Format

Character Set: ASCII
Suffix: .dat

Records format:

Code	;	Type	;	Description	;	Latitude	;	Longitude	<CR>

where:

Code	Up to AAAAA
Type	N among 1 (airport) or 2 (airfield) or 3 (VOR) or 4 (NDB) or 5 (VFR reporting point) or 6 (IFR reporting point) or 9 (user defined waypoint)
Description	Up to AAAAAAAAAAAAAAAAAAAAAAAAAAAA
Latitude	$DDMMSSSS
Longitude	&DDDMMSSSS

Legend

A	Any letter (A-Z), symbol or number (0-9)
N	Any digit (0-9)
$	N or S
&	E or W
D	One degree digit
M	One Minute digit
S	One second digit

Example:

LIRU;1;ROMA URBE;N41570500;E012300400